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MEMOIRS

OF THE

PEABODY MUSEUM OF AMERICAN ARCHAEOLOGY AND ETHNOLOGY, HARVARD UNIVERSITY.

VOL. I.—No. 3.

THE CHULTUNES OF LABNÁ,

YUCATAN.

REPORT OF EXPLORATIONS BY THE MUSEUM, 1888–89 AND 1890–91.

BY

EDWARD H. THOMPSON.

CAMBRIDGE:

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EDITORIAL NOTE.

THE following paper on the Chultunes of Labná was received from Mr. Thompson as a part of his report on the explorations of the ruins of the prehistoric city of Labná.

In the second Memoir of this series a brief statement is made in relation to the Peabody Museum expeditions to Yucatan. Some of the interesting structures described by Mr. Thompson in the following pages were explored by the Museum expedition in 1888–89; others were examined during the second expedition in 1890–91; and further observations were made by Mr. Thompson during the year or two following.

Mr. Thompson's researches show that these subterranean structures vary in their character. Some of them, he thinks, were primarily excavations made for obtaining a peculiar earth, called by the natives "zahcab," which was extensively used as a stucco to cover the walls of the rooms in the stone buildings, as well as for sculpture and for moulding into various forms, as many specimens from Labná give evidence. These excavations were afterward used as cisterns for collecting and storing rain water,—a necessary provision in this limestone country where water is so difficult to obtain.

Stephens was probably the first author to call attention to these subterranean chambers, both at Uxmal and Labná. He was at a loss to explain their use, but was inclined to regard several of those he examined at Uxmal as cisterns. One which he examined at Labná is described as being unlike those at Uxmal and not likely to have been a cistern (Travels in Yucatan, Vol. II., pp. 55–59). In his account of the cisterns at Uxmal (Travels in Yucatan, Vol. I., pp. 226–234) he mentions one in which he found a mound of earth and débris, apparently similar to those in the Chultunes of Labná described by Mr. Thompson. In this cistern he found a number of potsherds and a tripod vase; but he did not remove the earth, and therefore we do not know whether or not it contained human bones, as Mr. Thompson found to be the case in many instances at Labná.

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The finding of human bones and various objects in these subterranean chambers leads Mr. Thompson to believe that many of these singular structures were finally used as depositories for human remains, probably secondary burials in connection with some special rite, after which the opening to the Chultune was closed and cemented.

The use of these structures, so carefully made and so essential as reservoirs, as receptacles for human bones, and the fact that several have on the walls representations of birds, turtles, and other figures, indicate a singular and interesting feature in the customs of the unknown inhabitants of this ancient and ruined city. It is important to learn whether this custom prevailed in other prehistoric cities of Mexico and Central America.

The figures accompanying this report, showing the ground plans and vertical sections of a large number of these subterranean structures, together with the detailed accounts given on the following pages, represent the first systematic study of the Chultunes of Yucatan.

F. W. PUTNAM,
Curator of the Museum.

HARVARD UNIVERSITY, CAMBRIDGE,
SEPTEMBER 4, 1897.

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THE CHULTUNES OF LABNÁ.

THROUGHOUT many of the ruined groups of Yucatan there are subterranean structures of a peculiar class. These are generally single chambers of a vault-like appearance built from ten to fifteen feet beneath the surface and communicating with the outer world only by means of a narrow well-like opening placed near the apex of the vaulted roof.

These structures are sometimes well-built chambers, having their walls, roof, and floor of dressed stones, and finished with a coating of fine hard stucco. A typical example of this class is shown in Figs. 1 and 2, the original being the structure sunk into the second terrace of the "Palace," Ruined Group of Labná.

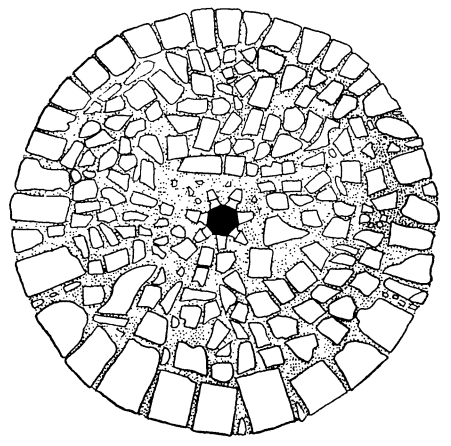

FIG. 1. — CIRCULAR PAVEMENT AROUND ENTRANCE TO CHULTUN, UPON SECOND TERRACE OF THE "PALACE," RUINED GROUP AT LABNÁ.

Others are of a much rougher class, and were formed in the cavities or pockets from which the white earth called by the natives "zahcab" had been taken.* These cavities, when their size and position were suitable, had their entrances closed up until only the circular opening was left. The roofs, walls, and floors were coated with thick layers of cement like stucco, which after being allowed to harden for a while was burnished into an impermeable surface by means of smooth stone implements, and the resultant structures so economically formed were ready for use.

I have called them all subterranean reservoirs, but opinions differ as to the use of these singular structures. Some students believe them to have

* Zahcab is very abundant throughout Yucatan. It is found in pockets of various sizes. It is a white earth of a peculiar character, and served the ancient builders, as it does those of the present day, as a building material to mix with lime in the place of silicious sand, which is practically unknown in Yucatan.

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been storehouses for grain and other food. I believe them to have been, first and foremost, reservoirs to receive and hold rain water as it fell during the wet season, against the needs of the dry season. While some of them may well have served as depositories, this use was only incidental, and not the prime intention of their builders.

My reasons for this belief are as follows: The greater portion of the peninsula of Yucatan is one huge mass of limestone rock, — a recent formation, geologically speaking, — and save in some specially favored location this formation is near the surface, forming a level, monotonous region over which flow no rivers. No bubbling springs gush forth to create oases of refreshing coolness for the insect-bitten traveller; and to many natives of the region open water is an unknown vision.

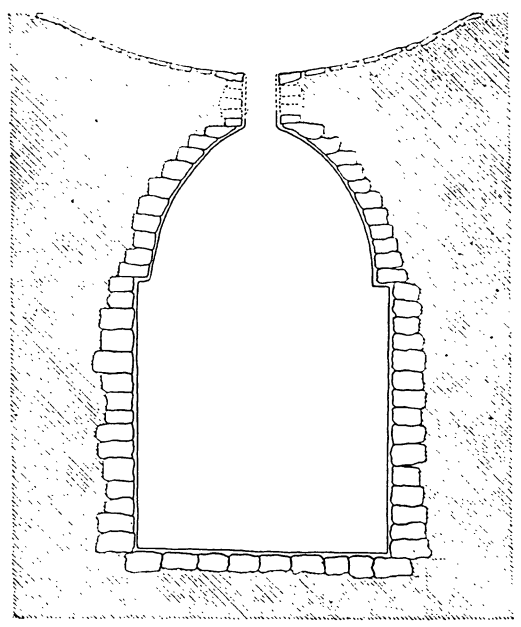

FIG. 2. — VERTICAL SECTION THROUGH CHULTUN, UPON SECOND TERRACE OF THE "PALACE," RUINED GROUP AT LABNÁ.

But two methods of water supply were available to the ancient builders. One was to seek for water in the depths of the earth, and the other to catch it as it fell from the clouds and store it for the time of need.

To seek for water by perforating through fifty or a hundred feet of solid rock, often flintlike in density, was evidently not to be thought of by them. I have never found a well that I am certain was dug by the builders of these ruined groups. To a certain degree nature helped the people out of this dilemma, and made it possible for them to obtain water. As is often the case in calcareous formations, many natural cavities exist in the rocky bowels of the peninsula. Some of these are open to the light of day, and extend down and into the water level by means of huge chambers or labyrinthian passages, ending suddenly upon the edges of pools of water as cool and clear as crystal, seeming, in the darkness of the gloomy space around them, to be pools of blackest ink.

These water caverns, called by the natives "ɔonot," now wrongly called by the modern natives "cenotes," or water caves, furnished an inexhaustible supply of the precious fluid, and were ever sought for and utilized. Large populations grew up around some of them. Chichen Itza, one of the largest groups of ancient ruins in the Americas, was built up around several of these great caverns. The name itself, "Chichen Itza," signifies in Maya,

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the mouth of the well of the Itzas: *ch*, mouth; *chen*, well; *Itza*, of the Itzas.

Steps cut into the solid rock, withe-bound ladders, and inclined planes, to-day as formerly, furnish the means of access to the coveted water. In some places the modes of approach are so difficult and dangerous that the general custom of the country has to be reversed, and the men, instead of the women, have to bring the water to the surface.

The groups of structures built far from the cenotes were of course debarred from this source of supply, and the natives were compelled to adopt the second method, that of collection and storage. Nature relented a little in their behalf also, and furnished them with "haltunes," which, translated into our language, means potholes in the impervious rock, that during the wet season became filled with water.

These potholes were numerous, and some were of great size. I found one in the jungle near the ruined group of Chuntichmool capable of holding several thousand gallons. Steps had been cut by the prehistoric water-carriers down the solid rock side and into the cavity, and as the water gradually lowered, by these steps they could follow it to the last drop. I found it nearly filled with the accumulated mould of centuries, but the water was still clear and potable.

But these natural reservoirs were in the very nature of things exposed and precarious. What more natural than that the people should seek to eke out the supply by storage in artificial reservoirs?

They did this in places by improving natural drainage and enlarging natural basins. They also made basins, some of them of large size. The ruined groups of Uxmal and Xkichnook furnish notable examples of this. The "akalches" that make Uxmal to-day a hot-bed of deadly fevers, are the supply basins of the ancient times; their once clear bottoms are now buried deep in swamp ooze, and decaying vegetation masks their true outline. Wild ducks, serpents, and great frogs are now the only creatures that can live beneath the great white sheet of miasma that each night shrouds the deserted yet magnificent piles near by.

In other places the people seem to have depended upon a large number of smaller reservoirs, — the subterranean chambers here described. Each edifice, each terrace, even of the same structure, had one and often more of these subterranean chambers. No one of them could hold a great quantity of water. The largest one I ever encountered held less than ten thousand gallons. Yet when these are counted by the score, as is the case in many of these groups, the aggregate amount of water supply will be found to be amply sufficient for the needs of a large number of persons, especially if the fact be taken into consideration that these people seem to have had practically no domestic animals and were, if they in any way resemble their descendants of to-day, remarkably abstemious in the quantity of water they

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drank. A white man will drink more water in one day than his native guide will in three days, and the native will be carrying a heavy burden while the white man is riding comfortably in saddle or volan.

We also note the significant fact that where the groups are built by the side of cenotes few, if any, of these subterranean chambers are found, while they are found by the score in groups not so favored by nature. The now ruined group of Labná is an example of this latter class. Built far away from any cenote, — the nearest one so far as known being the famous Loltun,* Cave of the Stone flowers, nearly twelve miles distant, — the inhabitants had to depend entirely upon the rainfall for their supply, so far as we now know.

Every one of the numerous hills that surround the group had its crown levelled and its steep sides cut into terraces, and every terrace examined shows traces of having had one, and sometimes two, of these reservoirs.

A wide area around the principal structures now standing is covered with mounds and terraces, and interspersed among these are subterranean reservoirs, one at least for every mound or terrace. Many are now difficult to find; some are hidden beneath the débris of the buildings that now form the mounds; others are almost obliterated by the caving in of their walls and the washings of centuries. Several are yet in shape for study, and one, which is represented by Figs. 1 and 2 from photographs and drawings made during the expedition of 1889, is so nearly intact that it could easily be restored to usefulness. Some were concealed. Their mouths were sealed by a heavy stone slab and cemented with thick stucco.

It seemed desirable that these curious structures should be investigated, and that their contents, whether detritus or material intentionally placed by man, should be preserved and studied.

This was neither an easy nor a safe undertaking. In fact, one of the narrowest escapes of my life came to me in the semi-darkness of one of these underground vaults. As one is being lowered by a rope down through the narrow well-like opening into the darkness beneath, there is always the charming uncertainty as to whether a viper's head will be thrust into one's face on the way down; whether the whir of a rattlesnake's rattle or the skurry of a nest of tarantulas or scorpions will be the first greeting on touching the chamber floor. The work was done, however, and fully sixty of these structures were subjected to investigation. Thirty-three of these yielded successful results, and the remainder were found to be either in a state of formation or else so entirely destroyed that even their original outline could not be traced.

Our method of working was as follows: First, carefully opening a sealed chultun, a lighted candle was lowered into the darkness beneath as a test for mephitic gas. A bunch of inflammable grass would have served

* See Report on Cave of Loltun, Memoirs of the Peabody Museum, No. 2.

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better, but as the charred grass would be scattered among the material accumulated upon the chamber floor and might thus cause doubt as to the authenticity of any charred material found actually in place, I deemed it best to allow no chance for doubt, and so used only sperm candles, the droppings of which could not be confounded with any other substance. A large bellows and a long flexible rubber tube formed a very effective means of replacing the mephitic layer with good, fresh, even if dusty, air. This enabled us to work with some degree of composure, although no amount of care could make the work in the close vault anything but intensely disagreeable. The least movement, the mere action of the expressed air from the tube, raised clouds of impalpable dust atoms, the accumulation of centuries. Alternate outside and inside work was the only available method by which the work could be carried on. Commencing at the extreme outer edge of the deposit upon the floor of the chamber, the excavation was carried on in diagrammed, vertical sections, each section being excavated by candle light with hand-brush and small trowel. The refuse material was then hoisted out of the chamber into the light of day, where it was passed through a large, finely-meshed sieve, and carefully scrutinized for specimens.

CHULTUN No. 1 (Plate I. Fig. 1), situated near the northeast corner of Mound 8, was the first chamber to be excavated. This chamber was closed by a large square stone placed over the mouth and firmly cemented into position by the usual cement of the ancients, — a mixture of one part slaked lime to two parts zahcab. This had then been covered over by loose rubble, over which had grown the jungle and large trees. It seems to have been originally one of the zahcab pockets before described. It is irregular in shape, fifteen feet in diameter at the base, and twelve in height to the circular opening, which is one foot six inches in diameter, with a height of three feet six inches, measuring from the termination of the orifice in the apex of the chamber roof to the surface of the terrace.

The accumulation of material on the floor was three feet deep directly under the orifice, and two feet deep near the chamber walls. This low mound-shaped accumulation was covered three inches deep with fine white dust, — the depositions and borings of myriad insect larvæ in the roof and walls of the chamber. The accumulation upon the reservoir bottom bore no evidence of stratification or gradual deposition save only in the upper six inches, which was a mixture of fine plaster particles, insect and reptile casts, mouse and iguana bones, snail shells, beetle wings, and spider cells. Directly upon the bottom of the reservoir was a large stone collar, similar to the one illustrated on Plate IX. Fig. 2. It was circular in shape and very smoothly finished. This collar had evidently been purposely broken, torn from its place, probably at the mouth of the chultun, and thrown in upon the reservoir floor. Close by it was found a circular stone, a disk that when placed over the restored collar just covered the central orifice. Thus

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we get a presumably correct idea of the methods the ancients used to prevent contamination of the stored water.

Mixed ashes and earth covered the floor to a depth of an inch, and in places nearly an inch and a half. In this deposit were found potsherds of various forms and patterns, a crystal bead (Plate X. Fig. 25), a bead of lime cement (Plate X. Fig. 36), and a fragment of an obsidian knife. In the earth immediately above this ash mixture were found potsherds, bones of animals and animal teeth, human heads in terra-cotta, and a human tooth. Fragments of human bones were also found, but very much decayed. In the next two feet of material were found an animal's head of terra-cotta (Plate XI. Fig. 15), a double whistle of terra-cotta (Fig. 3), and a portion of a cutting implement of bone. Among the most interesting of the specimens found was the mouthpiece and upper portion of a whistle of terra-cotta ornamented with a human head bearing an elaborate head-dress (Plate XII. Fig. 21).

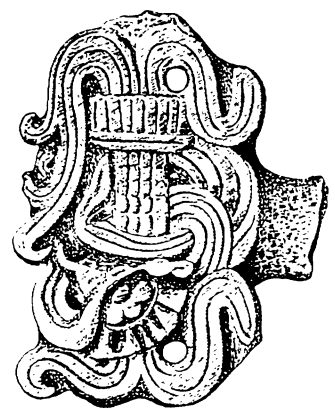

FIG. 3.—DOUBLE WHISTLE OF TERRA-COTTA, CHULTUN 1. $\frac{1}{1}$.

CHULTUN No. 2 (Plate I. Fig. 2), situated at the southern intersection of Mounds 3 and 4, was carefully sealed in the same manner as No. 1. The mound-shaped accumulation was of the same general character as previously described. The first foot of material seemed to have been carefully placed, and the rest thrown in carelessly. In the first foot above the actual floor were found potsherds, sea-shell pendants, beads of shell and lime cement, and human teeth and bones much decayed. In the remaining superimposed deposit were found potsherds, terra-cotta heads, human and animal, fragments of knives of obsidian and flint, a smooth ball of stone, bone beads, a pin or lip-plug of shell, the engraved shell disk shown in Fig. 4, and fragments of terra-cotta musical instruments. A whistle modelled in the form of a monkey (Plate XIII. Fig. 1, *a*), a finely polished washer-shaped object made from iron pyrites, the upper portion of a large whistle ornamented with a human head (Plate XII. Fig. 19), and the terra-cotta heads illustrated on Plate XI. Fig. 17, and Plate XII. Figs. 1, 2, and 8, were also taken from this reservoir.

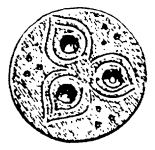

FIG. 4.—ENGRAVED SHELL DISK, CHULTUN 2. $\frac{1}{1}$.

On the northern wall the figure of a duck in high relief was moulded in the plastic stucco (Plate I. Fig. 2). On the walls of chultunes numbered 5, 9, 15, 27 are other similar figures of various animals.

CHULTUN No. 3 (Plate I. Fig. 3) is situated fifty feet south of the one just described. This was also sealed, but less carefully. The stone had become

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loosened by falling material and large roots had grown up within. There was the usual mound-shaped deposit about four feet high. The specimens found are as follows: A few potsherds, many fragments of objects in terra-cotta, including whistles (one of which is illustrated on Plate XIII. Fig. 1, *f*), cylindrical pieces with perforation through one end, a fragment of a circular stamp, several small terra-cotta balls, finely formed terra-cotta beads painted black, beads of shell (including those shown on Plate X. Figs. 9 and 11), beads of lime cement (Plate X. Figs. 30, 37, 46), stucco ornaments (Plate X. Figs. 48–50), and a portion of an engraved bone ring. Several heads in terra-cotta were found, three of which had been used as the upper portions of musical instruments (Plate XII. Figs. 17, 18, 20). Two other heads are illustrated (Plate XII. Fig. 9, and Plate XI. Fig. 19), a double whistle representing two monkeys (Plate XIII. Fig. 1, *b*), a number of shells of *Oliva* with the apex of each ground away for the passage of a cord, worked shells of several species, obsidian knives, a thick leaf-shaped implement of chalcedony (Fig. 5), and a broken instrument used in preparing agave fibre (similar to the one represented in Fig. 7).

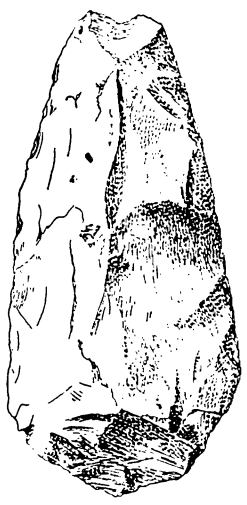

FIG. 5. — CHIPPED IMPLEMENT OF CHALCEDONY. CHULTUN 3. ½.

Three small clay vessels (Plate XIII. Fig. 2, *a*, *b*, *c*) were also found, — one at one foot six inches in the deposit above the floor, and the other two six inches higher up in the mass. They were perfect except that the largest one had its bottom perforated, as is often the case with vessels found in the ancient graves of Yucatan. The position in which they were found leads to the belief that they were once placed upright in the reservoir, and that the succeeding down rush of material, as it was thrown in, pushed them onto their sides. Below and around them were found the above-mentioned specimens, which were not arranged in any order, but seemed to have been thrown in at the same time as was the earth material. The soft character of this earth, a dark red loam, prevented the destruction of all, except the most delicate objects, and formed a yielding cushion around the small clay vessels.

FIG. 6. — FLINT KNIFE FROM CHULTUN 4. ½.

CHULTUN No. 4 (Plate I. Fig. 4) is situated two hundred and ninety feet southwest of "Old Edifice Group." The deposit was of the usual form and dimensions. The excavation yielded potsherds, an ornament of shell (Plate X. Fig. 17), human teeth, and the inner por-

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tion of a large univalve shell. These were found within two feet of the bottom. A perfect flint knife (Fig. 6) was in the material of the deposit above the first two feet. The first two feet of earth in this reservoir seems to have been carefully placed. It was mixed to some extent with ashes and charred cedar-wood. No traces of calcined bones were observed. The ashes and charred material found seemed to be entirely of wood.

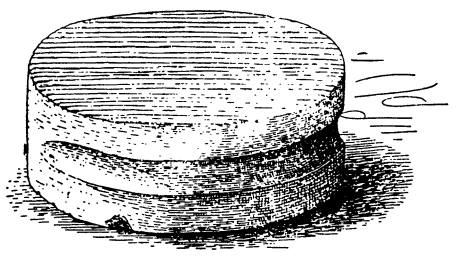

Fig. 7. — Implement of Limestone used in the Preparation of Agave Fibre. Chultun 6. ½.

Chultun No. 5 (Plate II. Fig. 5), situated seventy-five feet south of No. 4. The orifice, nearly six feet in diameter, was roughly formed of unhewn field stones. It was uncovered, and a large alamo tree had grown up in its cavity, the roots nearly concealing the opening from view.

This reservoir was nearly filled with the zahcab of the falling roof and walls, the usual insect sapping and mining being aided in this instance by the powerful wedging and leverage of the great alamo roots. The cleaning out of the obviously natural débris left two feet of earth material, evidently artificially deposited. In this deposit were found many potsherds, a part of a terra-cotta whistle, two terra-cotta heads once forming portions of musical instruments (one of which is illustrated on Plate XII. Fig. 16), a bead of shell (Plate X. Fig. 10), one of lime cement painted green in imitation of jadeite, and fragments of flint and obsidian implements; also portions of the cellular part of bones, probably human.

Upon the southeast wall of this reservoir, at a height of three feet above the floor, is the figure of a long-necked bird done in stucco. A similar figure was found carved in stone by the expedition of 1889.

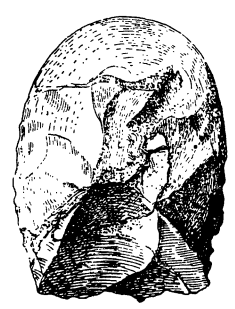

Fig. 8. — Chipped Implement of Flint with Polished Cutting Edge. Chultun 6. ½.

Chultun No. 6 (Plate II. Fig. 6) is situated one hundred and twenty-five feet south of No. 5. This reservoir had once been sealed, but the stone had become partially displaced, probably by the entering roots of some long-rotted tree. A confused mass of material was exposed to view, — entwined rootlets, cast-off skins of serpents, bones, excrement and teeth of bats, iguana bones, a thick covering of ancient mould, and over all the thick yellow colored webs of great spiders. Amid the earth on the bottom of the reservoir were found the usual potsherds, a portion of a flint knife, a well preserved grooved implement of limestone used in the preparation of agave fibre (Fig. 7), and a chipped implement of flint with ground cutting edge (Fig. 8). Various fragments of "katunes," or the roller of the maize grinding stone, were also found.

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CHULTUN No. 7 (Plate II. Fig. 7) is situated eighty feet northwest of "Old Edifice." It contained the usual mound-shaped deposit. Directly upon the thin layer of ashes on the floor of the reservoir were found potsherds, a fragment of obsidian knife, a shell bead, a square ornament of shell with five perforations (Plate X. Fig. 15), and beads of lime cement.

In the earth material two feet or less above this ash deposit were encountered potsherds, fragments of bone, a long narrow flint implement (Fig. 9), and the mouth-piece of a terra-cotta whistle.

CHULTUN No. 8 (Plate II. Fig. 8) is situated two hundred and forty feet southeast of No. 3. It was well sealed, and in perfect state. The mound-shaped deposit was three feet high. The general conditions were similar to the other sealed reservoirs. The excavation yielded potsherds of various sizes and patterns, fragments of terra-cotta musical instruments, two shell ornaments (Plate X. Figs. 14 and 23), and two moulds of terra-cotta, about two inches long (Plate XI. Figs. 2 and 4). These moulds are most interesting, since they show the exact method by which the terra-cotta heads and masks were made (Figs. 1 and 3 on Plate XI. are casts from these moulds). This is, so far as I can ascertain, the first known instance of these moulds being found in Yucatan. It is by no means common to find a single terra-cotta head. Those that have been found are treasured in museums and private collections. We have during these expeditions not only made a large collection of these heads, but have also obtained the moulds in which similar heads were made.

Besides these specimens there are two others of a very interesting character, a stone head (Plate IX. Fig. 1) which was lying upon the reservoir floor, and a small jar (Plate XIII. Fig. 2, *d*) from the deposit about two feet above the floor.

FIG. 9. — FLINT KNIFE, CHULTUN 7. ½.

CHULTUN No. 9 (Plate III. Fig. 9) is situated two hundred and ninety feet east of the northeast corner of the "Palace." The mound-shaped deposit is three feet high in the centre, and two feet six inches at the reservoir walls. The excavation yielded the usual potsherds, fragments of human bones, and human teeth, an obsidian knife, a worked crystal of calcite (Plate X. Fig. 28), a jadeite bead (Plate X. Fig. 26), and several beads of lime cement painted green in imitation of jadeite. The smaller cement beads are solid, but the larger specimens are hollow, and were probably made in this way to render them as light as possible (several of these beads are shown in Plate X. Figs. 29, 33, 34, 35, 38, 39, 40, 42, 43).

A well executed, mask-like head in terra-cotta (Plate XII. Fig. 15), painted black, was taken from this reservoir. The head is hollow, with an opening at the back and at the mouth and eyes. The upper portion of its

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duplicate, evidently made in the same mould, was also recovered, together with several fragments of terra-cotta objects, including whistles.

Upon the walls of this reservoir there are two effigies in high relief, a long-necked bird, and a turtle.

CHULTUN No. 10 (Plate III. Fig. 10) was sealed in perfect shape. It yielded no specimens beyond a few potsherds. It was the only reservoir, sealed or otherwise, that we had found so barren of specimens. The usual mound-shaped deposit was also missing; the earth was nearly level all over the reservoir floor. Yet it may have contained originally the most precious treasures, for in the northeast corner I found a heap of brown, dust-like atoms rather regular in shape, four inches deep, nine long, and eight wide. The termites had eaten it and digested it; the crickets and borers had made it their home for many thousand generations of cricket life; it had been a mass of impalpable tobacco-colored powder for ages perhaps, before time had compressed it into a semi-coherent mass. Fancy consequently could have wide range without fear of contradiction and without hope of proof. Yet I could not help feeling that that brown rectangular heap of snuff-like dust once was what to us would now be a priceless treasure. With a sigh I put away the thought and turned to absolute facts once more.

CHULTUN No. 11 (Plate III. Fig. 11) is situated one hundred and forty feet north of the northwest corner of the "Old Edifice." It was uncovered and filled with rubbish and general débris of all kinds. The bones of a young deer and the skeleton of a wild pig, a javali, were found in the upper layer of débris. In the earth at the bottom of this reservoir were found a few potsherds, a small stone ball, and a piece of worked sea-shell. The appearance of the lowest earth deposit indicated that it was deposited under water, a well-defined layer of regular mud sediment four inches in depth. After this stratum had occurred, the lime material, caused by the boring insects, mixed with vegetable débris, bat and mice bones, and snail shells from above, settled down upon the mud sediment, by that time almost stone-like in its hardness. Thus the accumulation gradually grew; and I find no trace of man's hand in aiding the natural accumulation. The stone ball, the potsherds, and the sea-shell were deposited, probably carelessly dropped in, while the reservoir still held water, or else while the mud was still soft.

CHULTUN No. 12 (Plate III. Fig. 12) is situated seventy feet west of No. 11, upon the same ruined terrace. This reservoir is almost exactly described by the account given of the preceding reservoir. Several bone fragments were found, so decayed as to make identification impossible, and also a few beads of lime cement (one of which is shown in Plate X. Fig. 41). Close by the floor of the reservoir was found a stone collar, of the class previously described, broken into three pieces.

CHULTUN No. 13 (Plate IV. Fig. 13) is situated three hundred and fifty feet southeast of No. 3. This reservoir had been carefully closed in the

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usual manner, but the entire north wall had caved in, covering the earth deposit with a layer of stone and lime over a yard thick. Removing this, we found a thin earth deposit only nine inches deep. From this we excavated a stone collar entire (Plate IX. Fig. 2), a small pitcher-like vessel almost intact (Plate XIII. Fig. 2, *e*), and some human bones very much decayed.

CHULTUN No. 14 (Plate IV. Fig. 14) is situated two hundred and sixty feet east of the "Palace." It was uncovered and half filled with débris. Excavations yielded potsherds and the terra-cotta heads shown upon Plate XI. Figs. 13, 18, 21, and 22, and Plate XII. Fig. 11.

CHULTUN No. 15 (Plate IV. Fig. 15) is situated one hundred and seventy feet north of No. 12. It was sealed completely. It contained the usual mound deposit. There was no evidence of any special care in depositing the first two feet of material. The excavation yielded potsherds, bones of animals, and a bead of lime cement.

Upon the walls of this reservoir are four figures in mezzo-relievo, — a snake, a turtle, a toad, and a nondescript creature.

CHULTUN No. 16 (Plate V. Fig. 16) is situated two hundred and eighty-four feet southwest of No. 13. It was uncovered and contained much débris. The excavation yielded only a few potsherds of the common classes and patterns.

CHULTUN No. 17 (Plate V. Fig. 17) is situated three hundred and twenty feet southwest of No. 16. The excavation yielded potsherds and a broken stone collar; also a portion of the skeleton of a native dog, including the skull.

CHULTUN No. 18 (Plate V. Fig. 18) is situated two hundred and twenty feet northwest of No. 14. It had been sealed, but the rock slab covering the opening had been cracked and forced apart by tree roots. The interior of the reservoir was a mass of roots. There was the usual mound-shaped deposit. The excavation yielded a broken stone collar, potsherds, fragments of human and animal bones, fragments of terra-cotta figures (one of which is illustrated upon Plate XII. Fig. 3), and a portion of a small jar similar to those already described. This jar was found lying on its side in the deposit, nine inches above the floor. An interesting specimen found in this reservoir was a large potsherd having the phallic emblem moulded upon it in low relief.

CHULTUN No. 19 (Plate V. Fig. 19) is situated two hundred and six feet northwest of No. 9. It was once sealed, but the cover is now entirely destroyed. The excavation yielded potsherds, several terra-cotta heads (Plate XII. 5, 6, 7, 10, 12, 13, 14), a shell pendant, fragments of obsidian knives, fragments of terra-cotta figures, and the portions of musical instruments illustrated on Plate XIII. Fig. 1, *e* and *i*. Fragments of bones were also found, but the dampness and other causes had left but little of them. This reservoir was built upon a low terrace densely overgrown with trees.

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CHULTUN No. 20 is situated three hundred and twenty feet southwest of the "Palace." It contained potsherds, fragments of animal bones, fragment of a bird-shaped terra-cotta whistle, beads of terra-cotta and white stone, and three terra-cotta heads.

CHULTUNES Nos. 21 & 22 (Plate VI. Figs. 21, 22) are situated three hundred and thirty feet southwest of No. 3. These two reservoirs are united. Evidently two pockets of zahcab had been worked until one broke into the other. When the zahcab was exhausted the two pockets were converted into reservoirs, each having its separate mouth, but with an open way connecting the two beneath the surface. This is the first instance of this class of reservoir encountered by me. No. 21 contained the usual mound-shaped deposit. The first three feet of this deposit, from the floor up, was clearly placed in position and apparently stamped or hand pressed. Upon the floor of the reservoir, with only a few inches of earth beneath them, were found two human skeletons smashed to fragments and decayed into mere lime dust, but clearly discernible as skeletons. Skeleton No. 1 was placed with the head toward the northeast, lying on its side with knees drawn up toward the chin, and facing the north. Skeleton No. 2 was placed directly north, in the same general posture. With these skeletons were found several small potsherds. Nearly a day was spent on each skeleton, with soft hand-brushes, forceps, and white glue atomizer, but the only portions of the skeletons that could be preserved were the enamel of the teeth and a few of the hardest joints of the bones.

CHULTUN No. 22 contained only a few common potsherds.

CHULTUN No. 23 is situated in the northeast corner of the Lower Rear Terrace of the Palace. Possibly this was once sealed, but it is now so destroyed that no actual proof exists. The excavation yielded potsherds, animal bones, — rabbit and javali, — beads of shell and lime cement, and a small highly polished disk of iron pyrites.

CHULTUN No. 24 (Plate VI. Fig. 24) is situated two hundred and twenty feet northwest of No. 9. This reservoir had been left unfinished; one side was not "evened off," and the stucco finish had not been applied. It contained only the tailings of the zahcab, the small stones that are always, even in the present day, left by the zahcab workers, and the surface material washed and blown in through the opening. Nine inches was the average thickness of the layer of this surface mould. Thorough investigation of the tailing did not yield a single specimen.

CHULTUN No. 25 (Plate VI. Fig. 25) is situated three hundred and twenty feet south of the "Palace." It was completely sealed in the usual manner. Seven small openings showed the burrows of moles and insects. It contained the usual mound-shaped deposit, consisting of earth mixed with bits of charcoal and ashes. The excavation yielded fragments of terra-cotta objects, including the well-modelled heads of quadrupeds (shown

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on Plate XI. Figs. 12 and 20), animal bones, obsidian knives, worked sea-shells (including the pendant illustrated on Plate X. Fig. 18), two pieces of flint lance heads or knives, and a small terra-cotta vessel (Plate XIII. Fig. 2, *f*). The cylindrical stone of an ancient corn-mill was also taken from this reservoir.

CHULTUN No. 26 (Plate VII. Fig. 26) is situated one hundred and eighty feet northwest of No. 23. It was completely sealed, and filled almost to the neck with earth material placed by human hands in its position. Allowing for settling, etc., it must have been completely filled when closed.

The lowest layer, a yard thick, contained fragments of human bones and human teeth, teeth of the dog, a chalcedony knife (Fig. 10), also the lower half of a similar knife of flint.

FIG. 10. — KNIFE OF CHALCEDONY. CHULTUN 26. ½.

The second layer of three feet, immediately above the preceding layer, contained innumerable potsherds, a terra-cotta whistle (Plate XIII. Fig. 1, *g*), a beetle of terra-cotta (Plate XI. Fig. 11), beads and ornaments of shell (Plate X. Figs. 1, 6, 12, 13), a bead of stone (Plate X. Fig. 24), beads of lime cement, and worked shell. This deposit was covered with a layer of lime and zahcab, borings of larvæ, and scalings from walls and roof.

CHULTUN No. 27 (Plate VII. Fig. 27) is situated in the north central portion of the rear high terrace of the "Palace." Huge stones, rectangular blocks, covered the mouth of this reservoir, but it is impossible to say whether it had been originally closed or not, as these stone masses had crushed the mouth out of all shape.

Very little material was upon the floor of this reservoir, less than two feet of earth material on a level. The excavation yielded small terra-cotta balls, and fragments of terra-cotta objects, including one of a human head and fragments of a mould shown on Plate XI. Figs. 8 and 9 (clay casts from these fragments are represented by Figs. 7 and 10 of this plate), bones of small animals, a portion of a flint knife, fragments of obsidian knives, a lime cement bead, painted green in imitation of jadeite, a stucco ornament similar to those illustrated on Plate X., a shell disk (Plate X. Fig. 19), a ball wrought from a calcite crystal, and a highly polished cylinder of the same material (Plate X. Fig. 27). Upon the eastern wall, at a height of three feet, we found the figure of a turtle on the stucco finish.

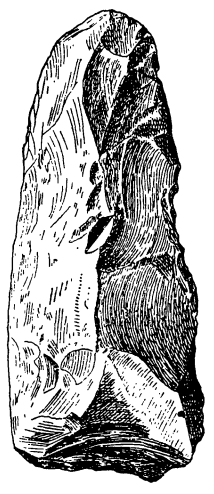

FIG. 11. — IMPLEMENT OF FLINT. CHULTUN 28. ½.

CHULTUN No. 28 (Plate VII. Fig. 28) is situated two hundred and

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forty feet west of the extreme right wing of the "Palace." It was uncovered, and filled to a depth of five feet with general débris. There was no evidence that man had placed the earth material within. The excavations yielded a great quantity of potsherds, a perfect obsidian knife, and two fragments, and the rude flint implements illustrated in Figs. 11 and 12.

CHULTUN No. 29 (Plate VII. Fig. 29) is situated one hundred and ten feet southwest of No. 28. It is a double-mouthed reservoir and is much destroyed. We commenced work under the belief that it had once been a closed reservoir, but subsequent investigation proved the stone covering of the mouths to be fallen building material. No specimens except ordinary potsherds were found in this reservoir.

CHULTUN No. 30 (Plate VIII. Fig. 30) is situated three hundred and ten feet northeast of No. 29. It contained the usual mound-shaped deposit. A large stone, that probably had once covered the mouth, had been moved to one side, evidently at a much more recent period. The earth deposit within did not seem to have been disturbed, as it retained its regular sequence of dark red earth capped by the zahcab castings.

FIG. 12. — IMPLEMENT OF FLINT. CHULTUN 28. ½.

The excavation yielded potsherds and terra-cotta fragments only. The earth was damp and mouldy, and any bones would probably have long since decayed.

CHULTUN No. 31 (Plate VIII. Fig. 31) is situated two hundred and twenty feet northwest of No. 30. It was well closed by a large stone and hard stucco. The deposit on the floor level was not mound-shaped. A thick layer of zahcab three feet deep, artificially placed, covered a mixture of earth and ashes nine inches deep, placed directly upon the reservoir bottom. In this lower layer we found fragments of terra-cotta objects, a bead of lime cement and one of shell, worked shell and two shell pendants (one of the pendants is illustrated on Plate X. Fig. 20), a terra-cotta mould for casting the head of a monkey (Plate XI. Figs. 5 and 6. Mould and clay cast), and a small terra-cotta vessel (Plate XIII. Fig. 2, *g*), which may have been an incense burner, having the top closed with the exception of an orifice three-eights of an inch in diameter. This interesting specimen, however, resembles one form of ancient Greek temple lamp far more than it does an incense burner. On one side of the flat top can still be seen the dark spot where the burning wick was placed. The terra-cotta mould is in perfect shape, and shows the method of casting the terra-cotta heads of which we secured so fine a collection.

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CHULTUN No. 32 (Plate VIII. Fig. 32) is situated one hundred and forty feet northeast of No. 12. This had once been sealed, but the stucco had been gradually worn away by gullies during the rainy seasons. The earth material within was damp and mouldy. The excavation yielded a few pot-sherds and bones of small animals. The steel sounding rod revealed the fact that this reservoir had a second bottom four feet beneath the first. This filling was composed of red earth and zahcab, mixed with field stones and stone chips. The excavation yielded two stone heads of rude workmanship.

CHULTUN No. 33 (Plate VIII. Fig. 33) is situated two hundred feet northeast of Mound 41. It was sealed, and the stone cover was in position. Less than a foot of earth deposit was upon the floor. This deposit had been placed and levelled by man. It contained a stone grinding mill or metate (Fig. 13), and a peculiar stone, — large, egg-shaped, and well worked, — and three shell ornaments (similar to Fig. 14 on Plate X.).

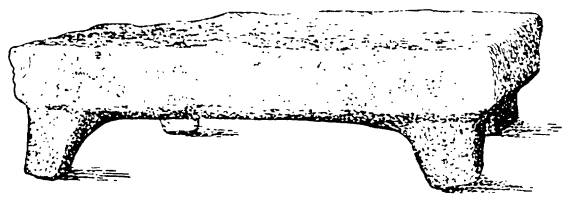

FIG. 13. — METATE, OR GRINDING MILL OF LIMESTONE. CHULTUN 33. $\frac{1}{6}$.

CHULTUN No. 34 is situated seventy feet northeast of Mound 41. It had been sealed, but the stone cover had been upheaved by the roots of a huge cholul tree. The space of the reservoir was completely filled by roots and rootlets, some as thick as a man's wrist, others as fine as a silken thread. The level earth deposit was two feet deep, and was covered with zahcab from the roof and walls. The deposit was damp and mouldy. The excavation yielded bones of quadrupeds, fragments of terra-cotta objects, two human heads of terra-cotta, and a head of a bird of the same material, two terra-cotta whistles, a broken musical instrument of terra-cotta still showing some of the blue paint with which it had been painted (Plate XIII. Fig. 1, *h*); also broken shell ornaments, a bead of lime cement, and a cylinder made from a calcite crystal.

To enumerate or attempt to describe the subterranean reservoirs which furnished no data would only serve to fill up the report with useless matter. Many of these were so situated that they naturally received all the washings of the neighboring mounds, and they were often filled nearly to the mouth with débris closely packed by the rains and hardened by ages into an almost stone-like mass, which made the work of excavation extremely difficult. We carefully investigated every chultun that could be worked with any

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chance of success. We found many new ones unknown to us during our first expedition; and while others undoubtedly still lie buried many yards beneath the masses of the fallen walls and covered by the dense vegetation, we feel certain that most of the chultunes in this ruined group of Labná have been located and thoroughly explored.

The results of this investigation would seem to prove, among other facts, that the sealed reservoirs were used as ultimate depositories for the dead. The greater number contained human bones or traces of them. In the case of two skeletons only could the actual position of the bodies be ascertained. Probably the others were removed from some previous receptacle and deposited in the chultun, together with the burial offerings, the earth heaped upon them, and the chultun converted into a tomb and sealed. The two skeletons, found apparently as the bodies had been placed after death, may have been exceptionally preserved by natural causes, and thus in this condition have been re-interred like the others.

I found no evidences of cremation. There was charcoal in these reservoir-tombs and ashes also, and I found a few charred bones, but so far as ascertained the bones were not human. I found no artificially split human bones or any other traces of cannibalism.

The numerous beads and pendants of gypsum, crystals, jade, chalcedony, and terra-cotta were found singly and scattered, evidently thrown in loosely as death offerings, and not left on the dead or deposited as necklaces or corded pendants.

If I am asked why this ancient people converted their precious reservoirs into ultimate tombs, I can only state the fact and cannot give the reason. It may have been because of the very preciousness and absolute necessity of these reservoirs that the people gave them up to their revered dead. In some lands the mourning one gashes his body, sacrifices his animals, his human slaves, and even his own life, to the memory of his dead lord and master. In this almost universal prompting of the human heart may we not find the solution of this strange problem, — the use of the sealed chultunes of Yucatan?

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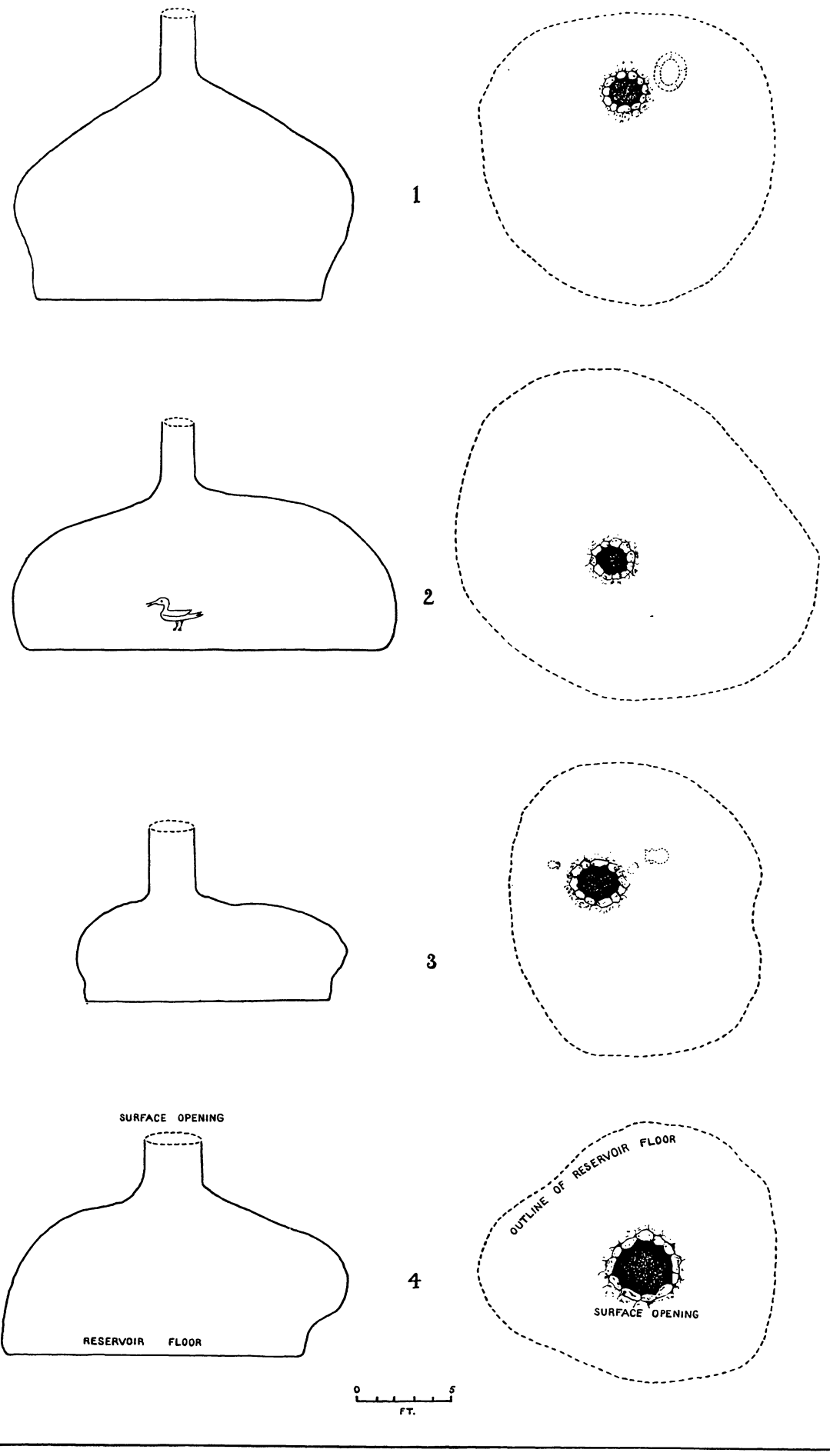

VERTICAL SECTIONS EAST AND WEST THROUGH SURFACE OPENING.

HORIZONTAL SECTIONS SHOWING OUTLINE OF FLOOR AND SURFACE OPENING.

THE CHULTUNES OF LABNÁ, YUCATAN.

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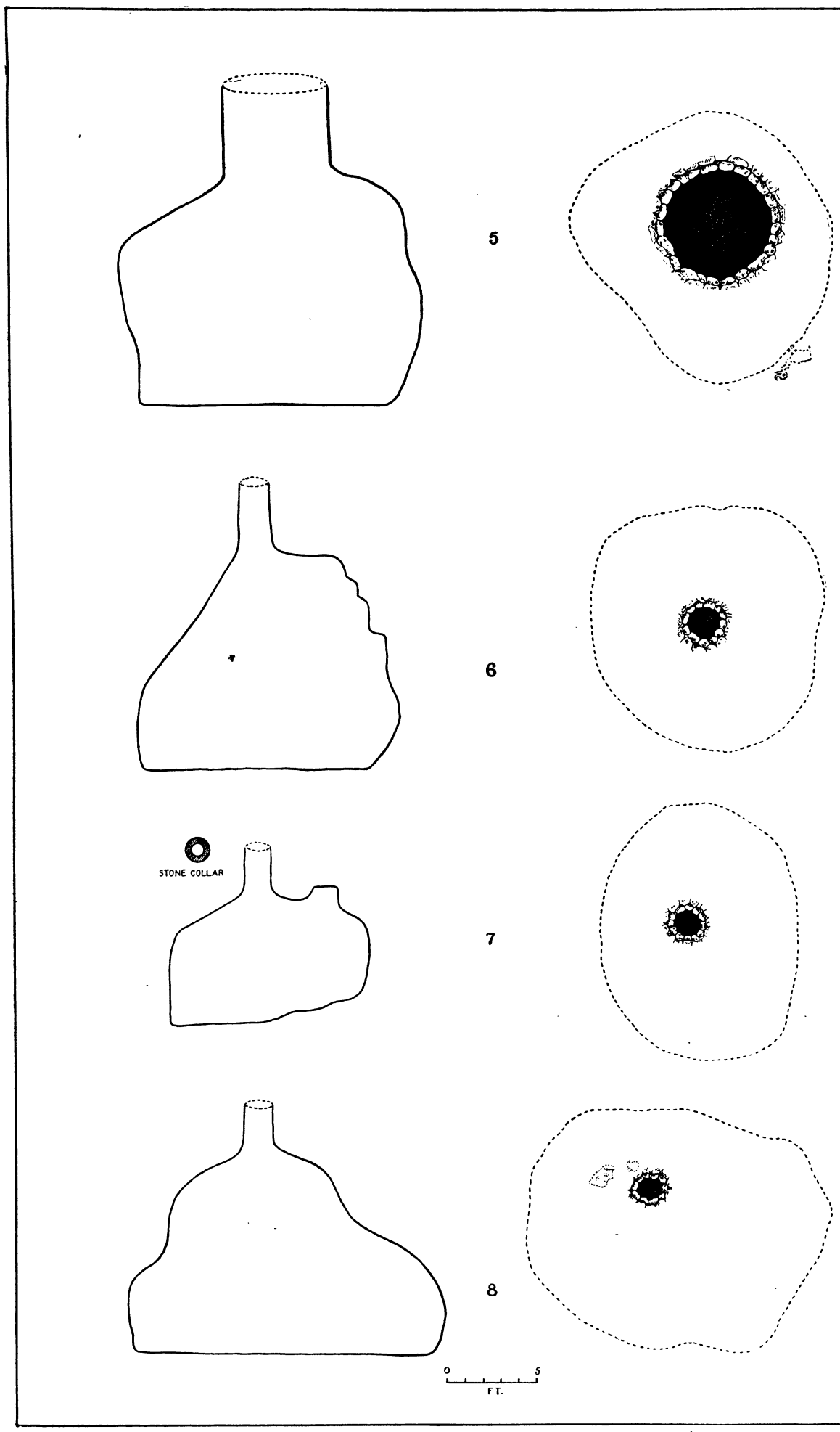

VERTICAL SECTIONS EAST AND WEST THROUGH SURFACE OPENING.

HORIZONTAL SECTIONS SHOWING OUTLINE OF FLOOR AND SURFACE OPENING.

THE CHULTUNES OF LABNÁ, YUCATAN.

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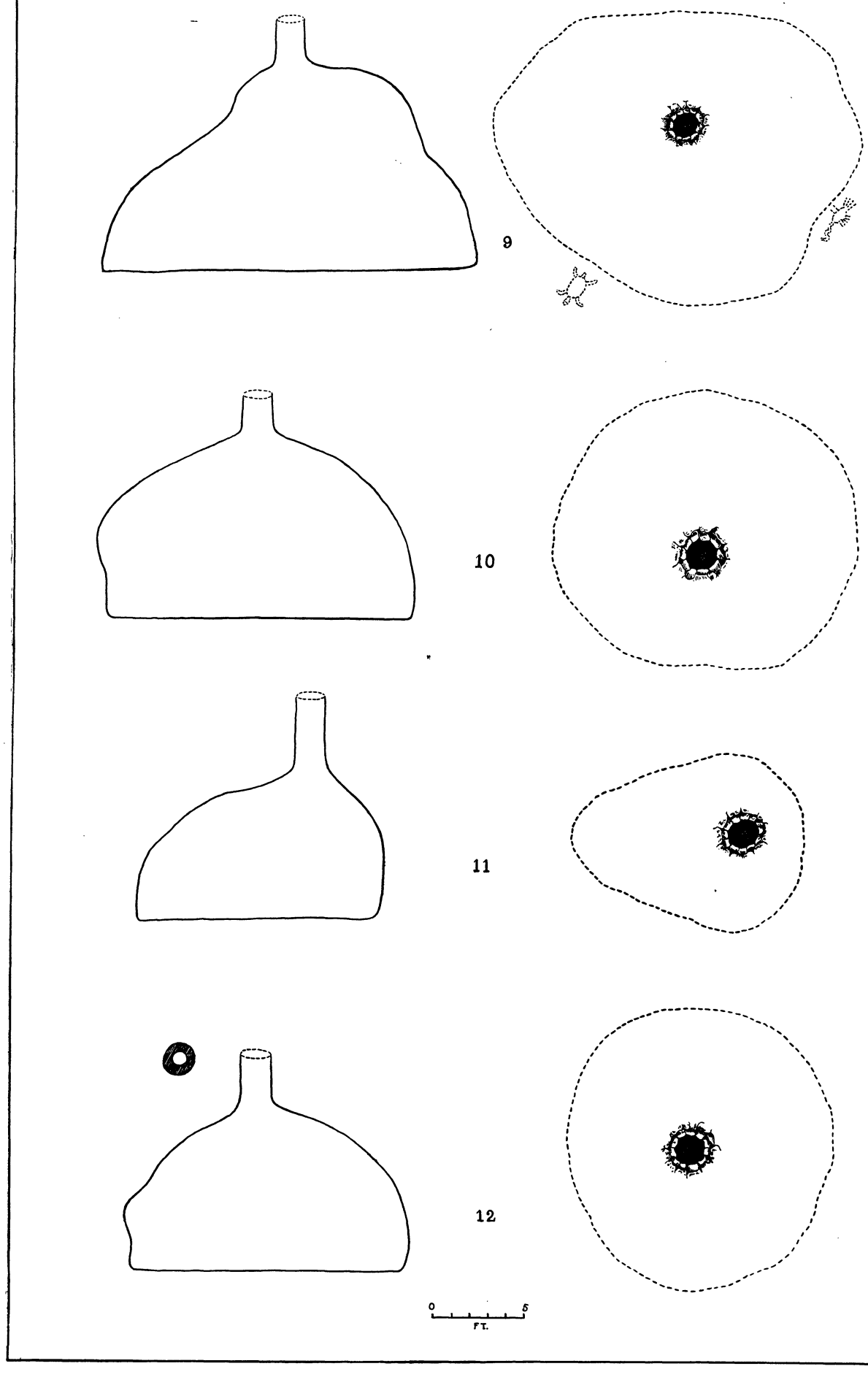

VERTICAL SECTIONS EAST AND WEST THROUGH SURFACE OPENING.

HORIZONTAL SECTIONS SHOWING OUTLINE OF FLOOR AND SURFACE OPENING.

THE CHULTUNES OF LABNÁ, YUCATAN.

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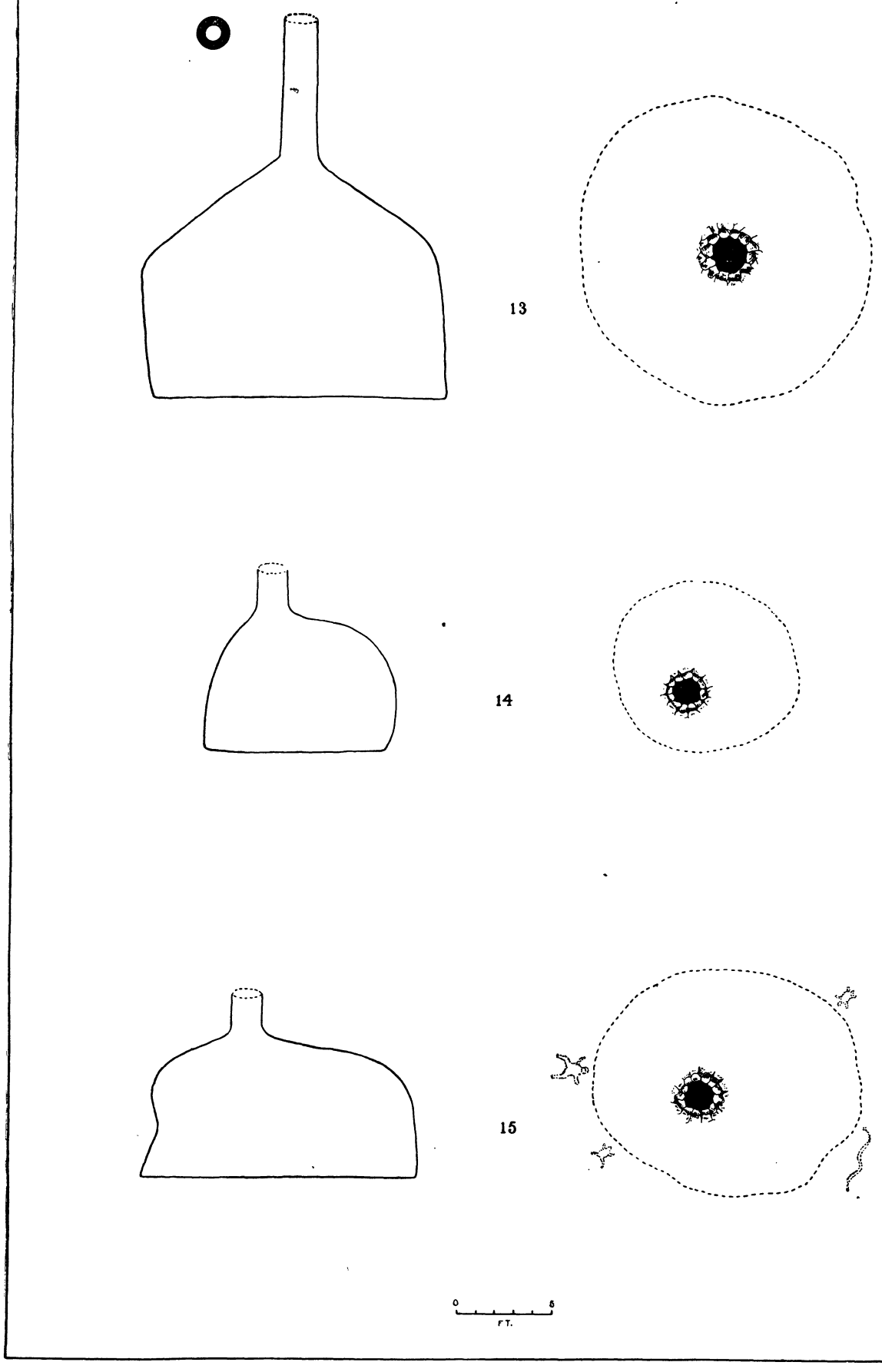

VERTICAL SECTIONS EAST AND WEST THROUGH SURFACE OPENING.

HORIZONTAL SECTIONS SHOWING OUTLINE OF FLOOR AND SURFACE OPENING.

THE CHULTUNES OF LABNÁ, YUCATAN.

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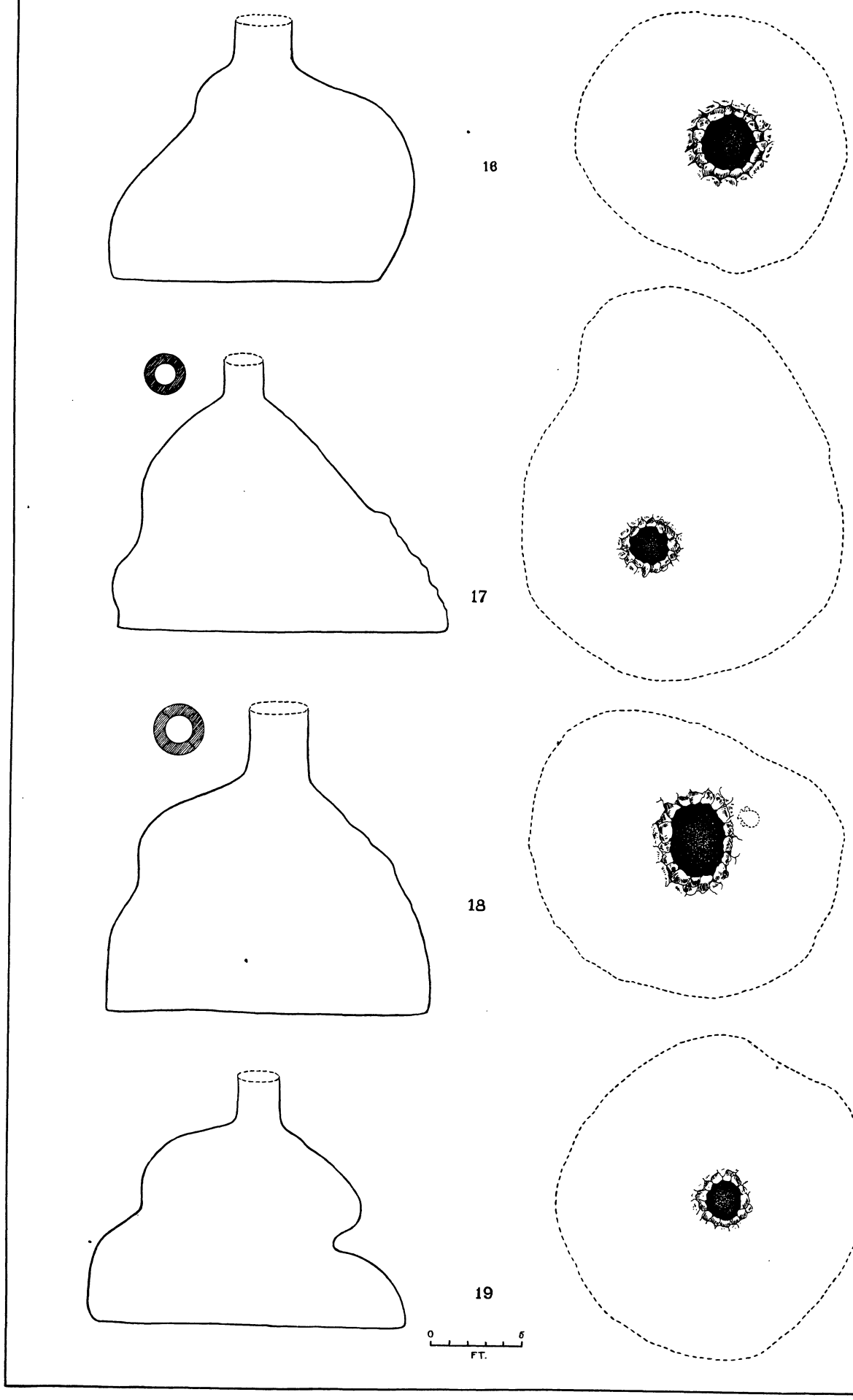

VERTICAL SECTIONS EAST AND WEST THROUGH SURFACE OPENING.

HORIZONTAL SECTIONS SHOWING OUTLINE OF FLOOR AND SURFACE OPENING.

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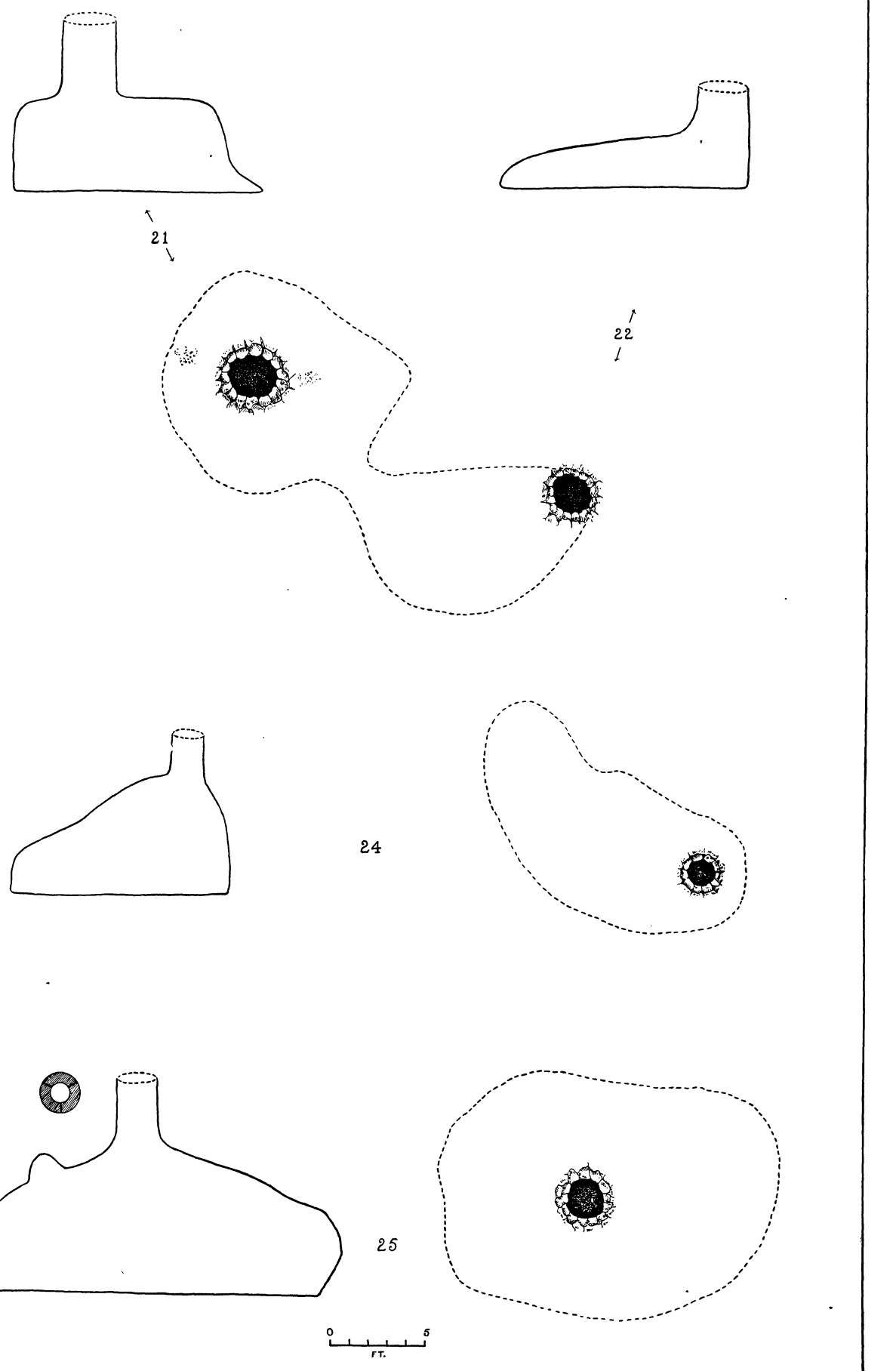

VERTICAL SECTIONS EAST AND WEST THROUGH SURFACE OPENING.

HORIZONTAL SECTIONS SHOWING OUTLINE OF FLOOR AND SURFACE OPENING.

THE CHULTUNES OF LABNÁ, YUCATAN.

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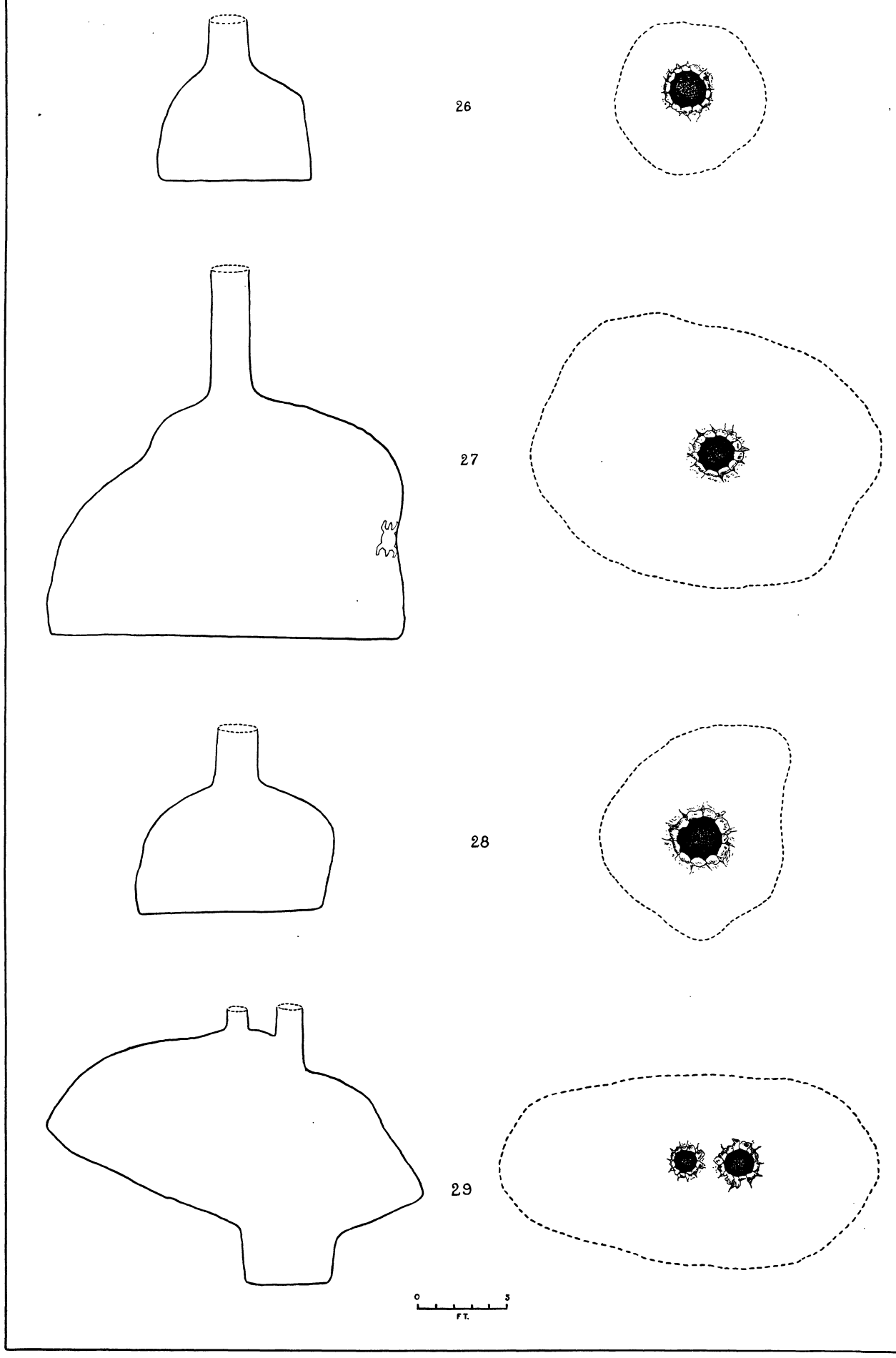

VERTICAL SECTIONS EAST AND WEST THROUGH SURFACE OPENING.

HORIZONTAL SECTIONS SHOWING OUTLINE OF FLOOR AND SURFACE OPENING.

THE CHULTUNES OF LABNÁ, YUCATAN.

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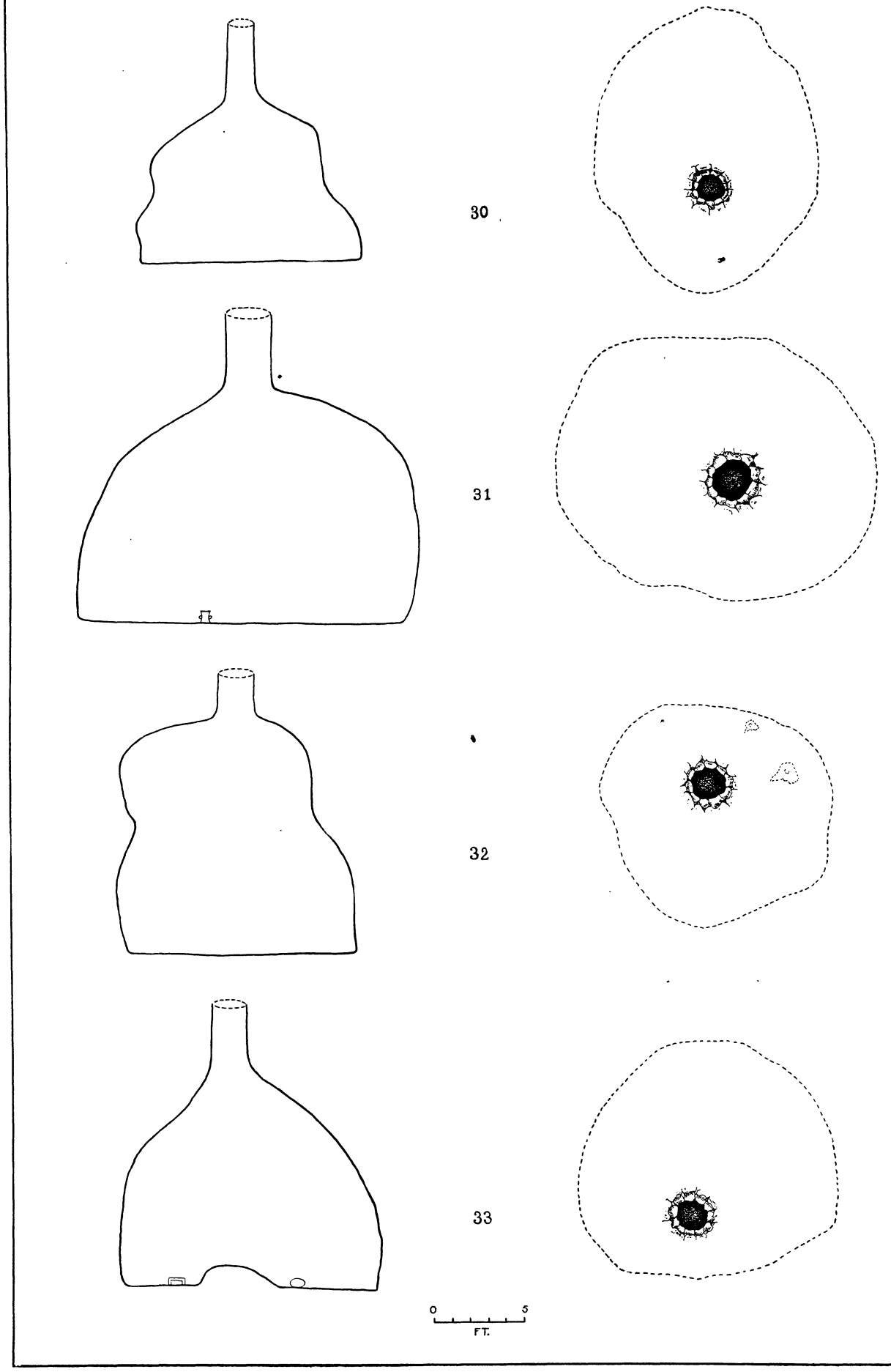

VERTICAL SECTIONS EAST AND WEST THROUGH SURFACE OPENING.

HORIZONTAL SECTIONS SHOWING OUTLINE OF FLOOR AND SURFACE OPENING.

THE CHULTUNES OF LABNÁ, YUCATAN.

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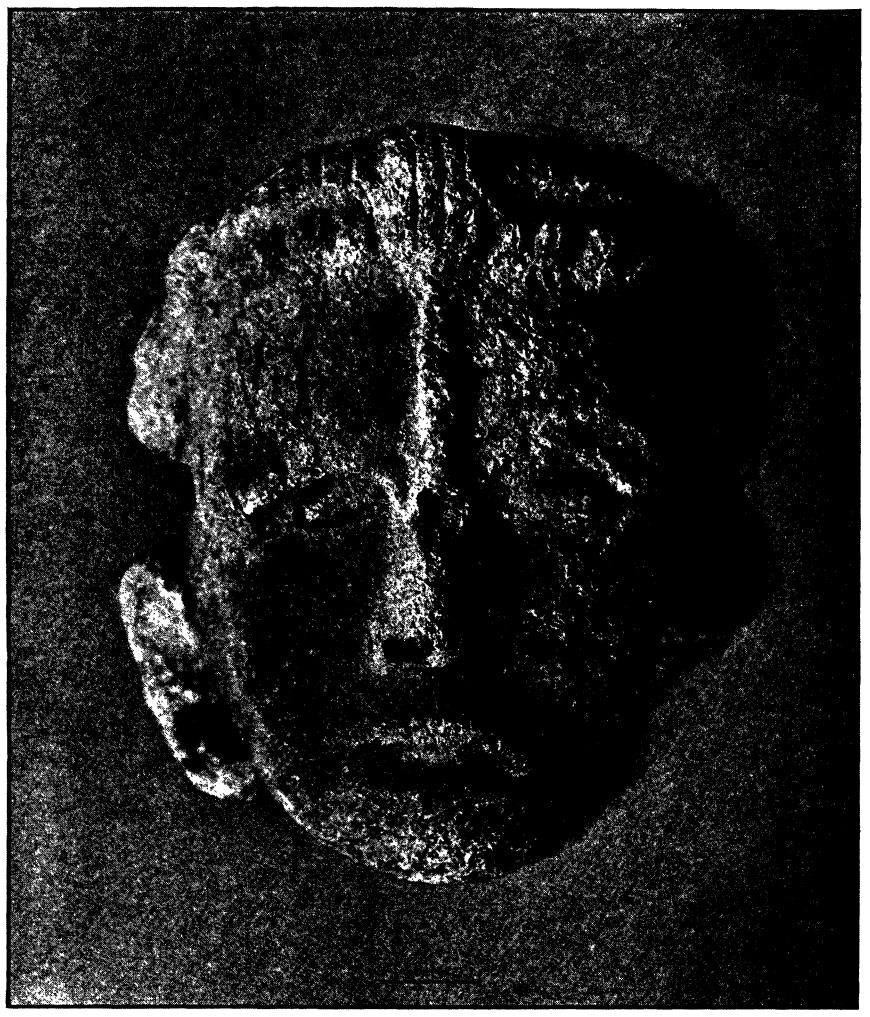

FIG. 1. HEAD SCULPTURED IN STONE, CHULTUN 8. LABNÁ, YUCATAN.

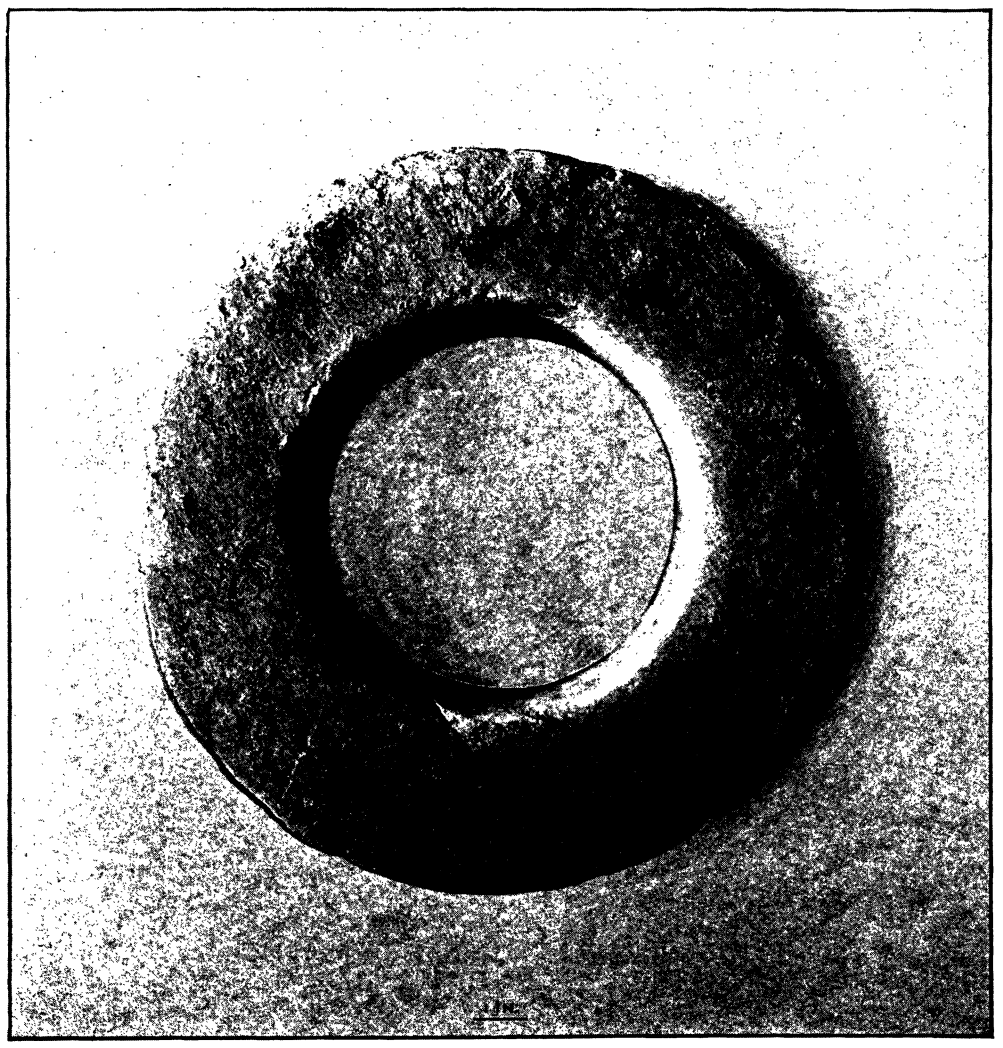

FIG. 2. STONE COLLAR, CHULTUN 13. LABNÁ, YUCATAN.

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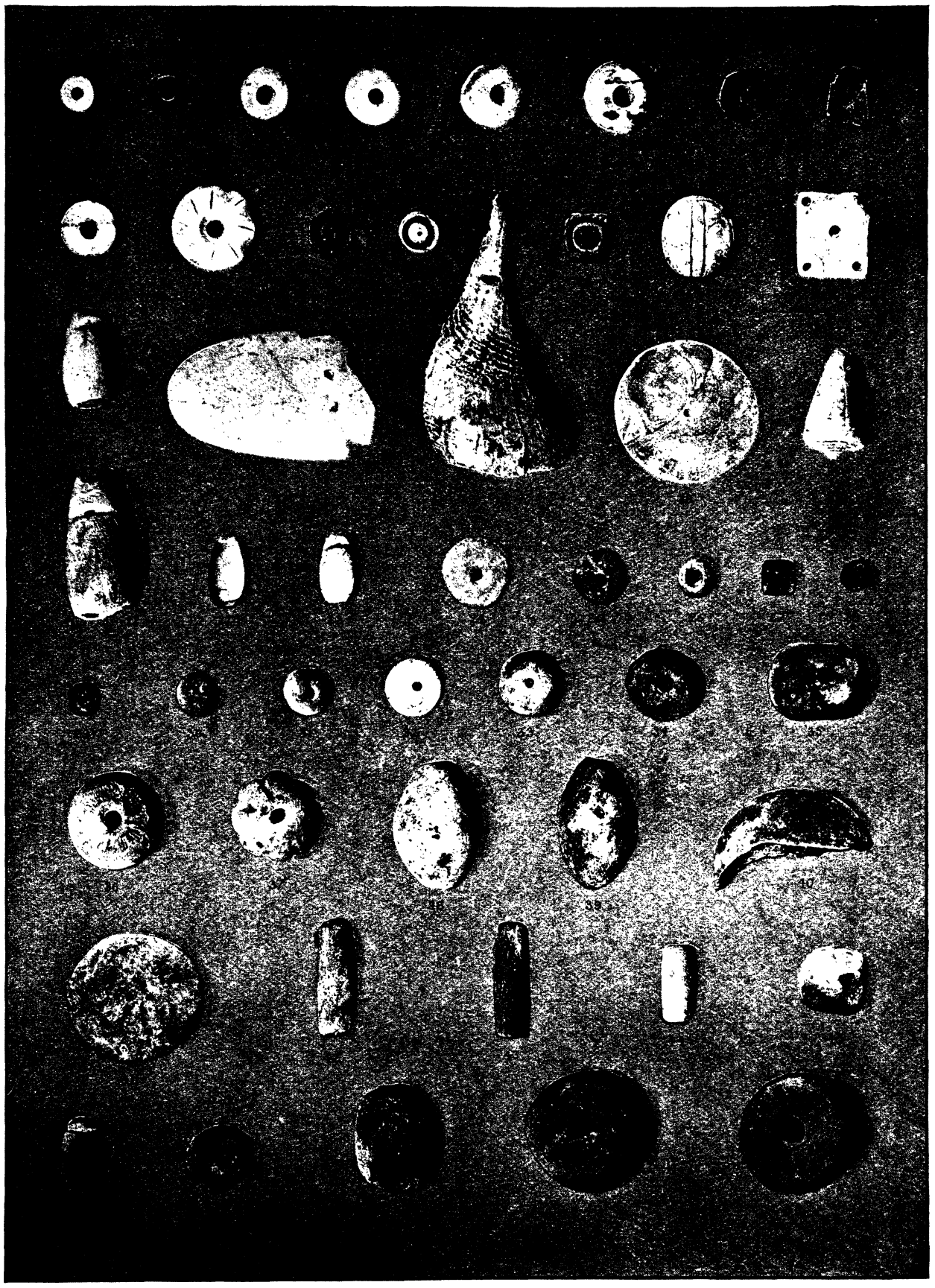

ORNAMENTS FROM THE CHULTUNES OF LABNÁ, YUCATAN.
1–23, Shell. 24–28, Stone. 29–50, Lime Cement.

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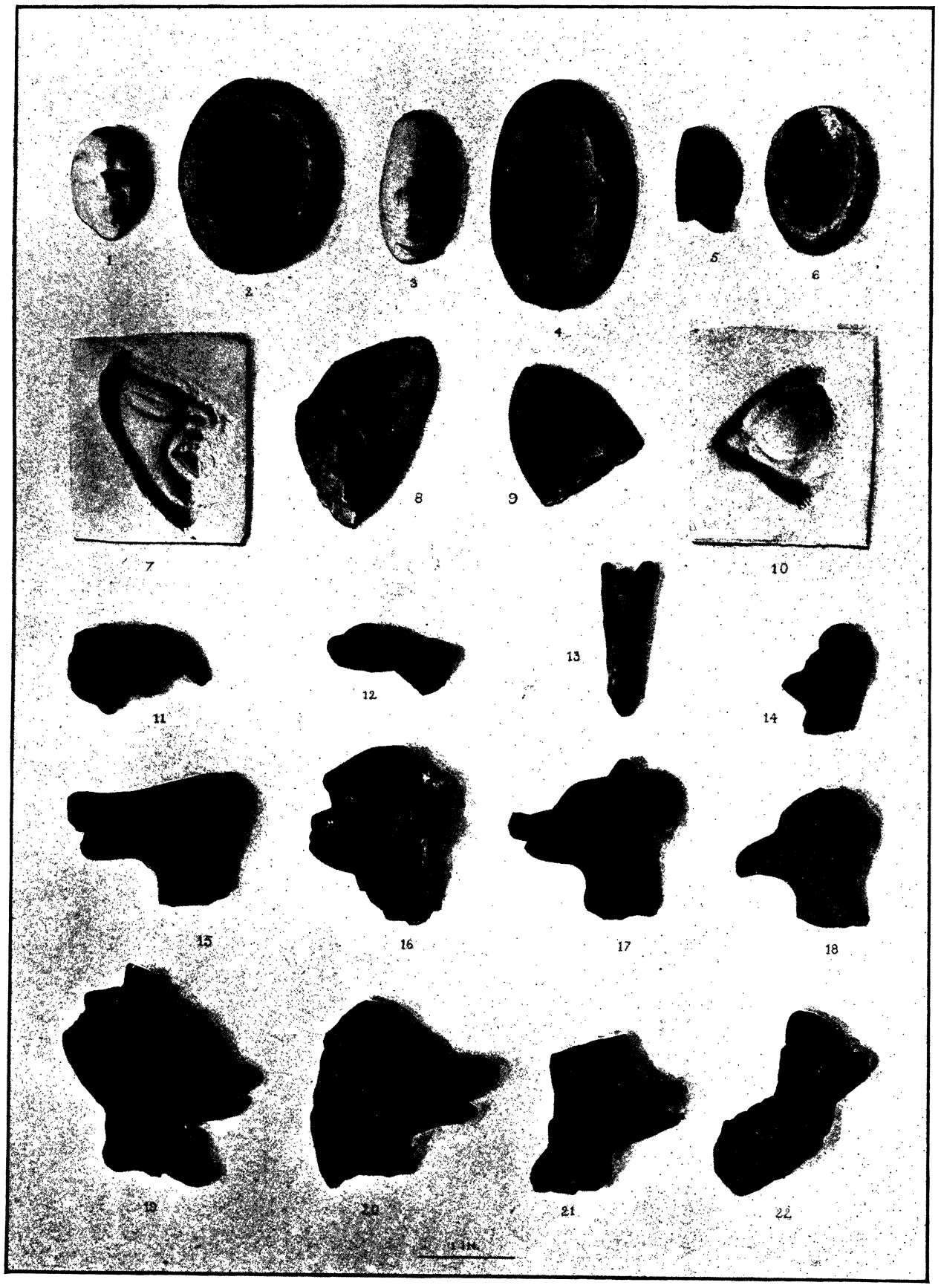

FIGS. 2, 4, 6, 8, AND 9, TERRA-COTTA MOULDS FOR CASTING CLAY HEADS. CHULTUNES OF LABNÁ.
FIGS. 1, 3, 5, 7, AND 10, CLAY CASTS FROM THE ABOVE MOULDS. FIG. 11, TERRA-COTTA BEETLE. CHULTUN 26.
FIGS. 12-22, TERRA-COTTA HEADS OF QUADRUPEDS AND BIRDS CAST IN MOULDS. CHULTUNES OF LABNÁ.

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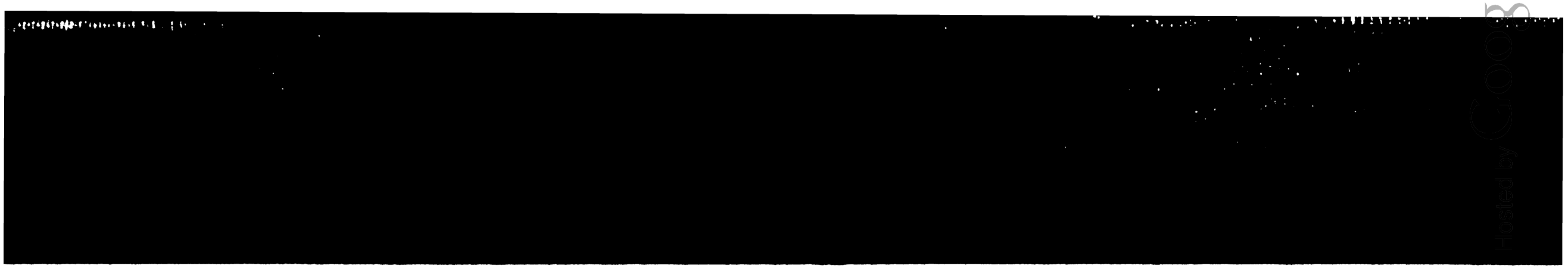

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